

**Virginia Department of Health**  
**Ricin: Overview for Healthcare Providers**

<b>Agent/ Characteristics</b>	Ricin is a naturally occurring protein toxin made from the bean of the castor plant ( <i>Ricinus communis</i> ). Beans contain 1-5% ricin by weight, and ricin is easily isolated from the bean. Once extracted, ricin can be processed into a powder, mist or pellet, or dissolved in liquid. Ricin acts by disrupting ribosome function, leading to inhibition of protein synthesis. Medical uses for ricin have been investigated.
<b>Potential Sources</b>	Ricin is generated as a by-product formed when castor oil is extracted from castor beans. Ricin intoxications have occurred from consuming castor beans.
<b>Route of Exposure</b>	Injection, inhalation and ingestion: highly toxic. Dermal: not absorbed through intact skin.
<b>Ricin as a Bioterrorism Agent</b>	Ricin is a Category B agent. It could be acquired or manufactured for use as a biochemical weapon.
<b>Contamination/ Decontamination</b>	Contamination: Ricin is not volatile and does not off-gas and form vapor. Patients suspected of being contaminated should be decontaminated prior to arrival in medical facility. Those doing the decontamination should wear a full chemical resistant suit with gloves, surgical mask and eye/face protection (e.g., face shield and goggles). Decontamination: People with only skin exposure to liquids or powders should remove clothing and wash skin and hair with soap and water. People with only ingestion exposure do not require skin decontamination. After decontamination, standard precautions are adequate.
<b>Risk Indicators</b>	If absorbed systemically, ricin is highly toxic to all people. Extent of injury depends on the concentration, duration and route of exposure. Children, the elderly and those with underlying chronic illness (e.g., coronary artery disease, pulmonary disease, seizure disorder) may be more susceptible to ricin.
<b>Cause of Death</b>	Injection and Ingestion: multiple organ system failure, vascular collapse, hypovolemic shock Inhalation: pulmonary edema leading to hypoxemia.
<b>Latency</b>	Based on limited human cases and animal studies, symptom onset occurs within hours of exposure. Death may occur within 3-5 days of exposure.
<b>Clinical Manifestations</b>	Exposure causes a chemically Induced radiation-like syndrome. Specific signs and symptoms vary with dose and route of exposure. Injection: Pain at injection site and local lymph nodes, sepsis/influenza-like illness (fever, fatigue, weakness, myalgias, nausea, vomiting) progressing to multiple organ system failure (liver necrosis, nephritis, splenitis, GI bleeding), vascular collapse, hypovolemic shock. Inhalation: Cough/congestion, chest tightness progressing to fibrinopurulent pneumonia; pulmonary edema, necrosis and hemorrhage; respiratory failure. Ingestion: Sore throat, headache, nausea, vomiting, abdominal pain, diarrhea, GI bleeding, multiple organ system failure (liver necrosis, nephritis, splenitis), anuria, vascular collapse, hypovolemic shock.
<b>Laboratory tests/ Sample collection</b>	Confirmatory diagnostic testing: None available. Monitor clinical effects and complications: CBC, renal function, liver function as indicated. Public health officials may request specimens for testing. For consultation, call the state public health laboratory (DCLS), available 24/7, at 804-335-4617.
<b>Radiography</b>	Obtain x-rays as indicated by clinical presentation.
<b>Treatment</b>	Supportive care (e.g., mechanical ventilation, fluid and electrolytes, anti-inflammatory agents, analgesics) is the mainstay of therapy. Antidotes: None.
<b>Precautions/ Disposition</b>	Pitfall: Not considering a chemical exposure as a cause of a radiation-like or sepsis-like illness. Disposition: Asymptomatic patients may need extended periods of observation if large exposures.
<b>Notification</b>	All chemical exposures should be reported to the regional poison center at 1-800-222-1222. Outbreaks and unusual occurrences are reportable to your local health department. If this is a suspected emergency, report the incident to the local 911 center.

Additional information is available at: <http://emergency.cdc.gov/agent/ricin/index.asp>, and at: <http://jama.jamanetwork.com/article.aspx?articleid=201818&link=xref>